GYA AGM and International Conference of Young Scientists

Hyderabad, India
10-13 June 2025

Member Research Talks

Book of Abstracts

10 June 2025, 17:30 – 18:45

Three parallel sessions

Sessions 1 through 3 are outlined in the schedules below, followed by the full abstracts sorted in alphabetical order by first name.

Research Talks Session 1 – Seminar Room 8, Second Floor

Moderator: Reem Abou Assi

Borgar Aamaas	Continued global warming from aviation in the 21st century
Viviana García Pinzón	Confronting epistemic violence? A virtual encyclopaedia as a way of re-centring the pluralities of knowledge in peace and conflict studies
Anina Rich	Attention in a cluttered moving world
Ovie Edegbene	Evaluating the Health of Urban Streams in Africa Using a Functional-Based Approach
Yolanda López-Maldonado	Indigenous Science Diplomacy: Elevating Indigenous Voices for Sustainable Global Futures
Oscar Xavier Guerrero Gutiérrez	How AI Can Help Us Understand Molecules Better—and Faster
Mutshidzi Mulondo	Integrating Mental Health into Primary Healthcare in Africa
Praveen Kumar	Harnessing Spin-Dependent Catalysis in 2D Materials for Energy Harvesting Applications
Antonia Saktiawati	The potential of an electronic nose as a screening tool for tuberculosis (TB)
Thiago Lima	The use of residual biomass for energy purposes: driving sustainability and circular economy
Veda Krishnan	Do you know gut taste what we eat?
Prabhat Singh	Fluorescence-based Sensors for Alkaline Phosphatase: Leveraging AIE and Supramolecular Aggregation
Elena Kuzmin	Synthetic Lethal Interaction Network of Chromosome 4p Loss In Basal Breast Cancer
Reem Abou Assi	Science Impact To Heal Conflict Zone Youth: When Humanity Is Given A Second Chance

Research Talks Session 2 – Seminar Room 9, Second Floor

Moderator: Aram Simonyan

Alexandra Milanova	**Culture means more: The potential of cultural diplomacy in addressing global challenges**
Éva Dékány	Categories in language: the plain vanilla, the missing and the mixed
Martin Schletterer	River Science and sustainable management
Pooja Devi	MXene and MXene Dervied Heterostructure-Potentail Catalyst for Green Hydrogen
Hanjo Hamann	Don't Sign Away Your Copyright!
Natisha Dukhi	Teens Want Tech: Exploring App Solutions for Adolescent Health
Luisa Maria Diele-Viegas	Bridging Scientific and Traditional Knowledge for Environmental Conservation
Mbuzeleni Hlongwa	Integration of PrEP Dispensing with HIV Self-Testing Among Men in KwaZulu-Natal, South Africa
Malgorzata Gazda	Meta-research- science of science
Xavier Chiriboga Morales	Empowering insect science for global cha(lle)nge(s)
Monir Ahmed	Does the world have visionary leaders to achieve the SDGs?"
Mojtaba Abdi Jalebi	Functional Nanostructured Materials for Solar Cells and Green Fuel Production: Pathways to a Sustainable, Carbon-Neutral Future
Thao Thi Phuong Nguyen	CRISP Project – Smartwatch & Mobile-App Integrated AI Screening for Mental Health
Aram Simonyan	"Power Dynamics in Corruption: How Bribe Takers Outpace Bribe Givers in Shaping Social Norms Through Rationalization"

Research Talks Session 3 – Conference Room 3, Second Floor

Moderator: Wilson Alavia Medina

Miriam Cohen	**Human Rights and Climate Change: Connecting the Dots**
Nina Yasuda	Exploring Inter-disciplinary research for Marine biodiversity conservation
Shymaa Enany	From Birds to Humans: The Story Behind the Second Genome of a Novel Pathogen
João Borges	Self-assembling Multicomponent Biomaterials for Controlled Drug Delivery and Regenerative Medicine
Alma Cristal Hernández Mondragon	Sowing Futures: Rethinking Scientific Careers for Social Impact
Tomislav Mestrovic	The Past, Present and Future of Antimicrobial Resistance Burden: a Data-Driven Call to Action
Abdulsatar Sultan	Books on Wheels: Reviving Mosul Through a Green Mobile Library
Piyush Kumar	Tooth as a Time Capsule: Uncovering Early-Life Stress and Environmental Exposure via Chemical Imaging
Mohammed Mostajo-Radji	Reducing education inequalities through cloud-enabled live-cell biotechnology
Meriem Chaanaoui	Solar Heat for Industrial Processes: Insights from The Phosphate Solar Drying Research Project
Shabana Khan	Infodemic & Disaster Risk Communications: Key Challenges and the Way Forward
Nova Ahmed	Necessary Ingredients needed to Success: Looking at Women in Computing of Bangladesh
Wilson Alavia Medina	Carbon capture for a sustainable future: Opportunities and challenges

Abdulsatar Sultan

Catholic University in Erbil, Iraq

Books on Wheels: Reviving Mosul Through a Green Mobile Library

In the aftermath of conflict, Mosul's recovery hinges not only on rebuilding infrastructure but also on restoring its cultural and intellectual vibrancy. Recognizing this need, I spearheaded the creation of Iraq's first Green Mobile Library—a groundbreaking initiative that combines literacy promotion with environmental sustainability. This mobile library is a beacon of hope, traveling through the streets of Mosul and its surrounding areas, providing access to books, digital resources, and educational programs for children, youth, and adults. It is not merely a repository of knowledge but a platform for community engagement. Through workshops on creative writing, environmental awareness, and critical thinking, it fosters lifelong learning and encourages active participation in Mosul's reconstruction. The library operates using renewable energy sources, embodying the principles of sustainability. By integrating green technology into its design, it not only addresses immediate educational needs but also promotes awareness of sustainable practices in a region deeply affected by environmental challenges. At its heart, this initiative represents resilience and renewal. It seeks to restore Mosul's identity as a hub of knowledge and culture while bridging divides and empowering communities to shape a brighter future. This talk will share the journey of conceptualizing and implementing the Green Mobile Library, its impact on local communities, and the lessons learned in using education and sustainability as tools for recovery and hope. By investing in education and sustainability, we pave the way for a more resilient and empowered society, ensuring that Mosul's story is one of renewal and progress.

Alexandra Milanova

Bulgarian Academy of Sciences, Institute of Balkan Studies & Centre of Thracology, Bulgaria

Culture means more: The potential of cultural diplomacy in addressing global challenges

It is broadly assumed that the role of culture in international relations has two main ramifications. First, it creates domestic conditions and guidelines for foreign policy decision-making. Second, culture is a powerful tool that a state deliberately uses to influence the international community. As for cultural diplomacy, it can be defined as governmentally facilitated communication with a foreign audience through what is considered culture. It is also an exchange of ideas, information, art, and other aspects of culture among nations and their peoples in order to foster mutual understanding. Therefore, cultural diplomacy is an effective way for any country to present its identity and cultural heritage abroad, and thus to contribute to the development of foreign cooperation. Against this background, my research is trying to prove that culture is in fact more than just an important factor in the realization of foreign policy goals. It is as an asset in eradicating poverty, addressing social inclusion and inequality, and creating economic growth. Based on this understanding, one of my main points is that cultural diplomacy, or the so-called soft power, is a specific tool for promoting peace and stability. In today's increasingly globalized and interconnected world, where mass communication allows people to connect more easily with each other, cultural diplomacy is a key driver for preventing conflicts, as well as for addressing myriad global challenges. Can this not be the power we seek in order to create brighter future? Only by looking at the way

forward collectively will we be able to understand better the potential of cultural diplomacy and to employ it in order to build a better world.

Alma Cristal Hernández Mondragon

Cinvestav, México

Sowing Futures: Rethinking Scientific Careers for Social Impact

In a constantly changing world, the traditional scientific career path is no longer sufficient to meet the complex demands of our societies. We need to rethink what it means to be a scientist and expand our roles beyond the laboratory and academia. In this talk, I will reflect on how we can build new pathways that allow scientists to engage more actively with society, inspire others, and contribute to long-term transformations. I believe that part of our mission is not only to contribute, but to enable others to contribute more powerfully. As scientists, we can offer another step on the ladder, one that future generations will be able to climb to reach heights we never imagined. This requires changing how we define success in science, how we evaluate academic work, and how we open up space for new ideas and disciplines that connect science with societal needs. I will share lessons learned from the scientific mentoring programs we have developed at Cinvestav, including local, national, and now international training initiatives. These programs provide scientists, scientific advisors, policy researchers, and changemakers. Through this reflection, I hope to generate ideas that not only advance knowledge, but also build bridges, challenge systems, and ultimately leave a lasting impact on the world.

Anina Rich

Macquarie University, Australia

Attention in a cluttered moving world

Our modern environments are challenging our attention in ways the human brain has not evolved to deal with effectively. Features that capture attention are being deliberately used in technology to interrupt and disrupt our focus. Programs promoted to boost productivity are having the opposite effect. My work focuses on the way in which attentional mechanisms work and the consequences of different factors, including interruptions, on sustained attention. Using various methods to measure brain activity and new analysis methods to track moving stimuli, we have been working on how we can predict lapses of attention before resulting drops in performance occur. This work has high relevance for the way in which we set ourselves up to work, learn and play.

Antonia Saktiawati

Universitas Gadjah Mada, Indonesia

The potential of an electronic nose as a screening tool for tuberculosis (TB)

TB remains a global health threat, particularly in resource-limited regions where early diagnosis is challenging. There is a pressing need for an accurate, affordable, and non-invasive diagnostic tool. Breath analysis, which detects specific volatile organic compounds, holds promise for disease detection. We developed an electronic nose (e-Nose) inspired by human olfaction, augmented with artificial intelligence, to screen for TB through breath samples.
Method:
Conducted in diverse Indonesian cities, including in remote areas of Papua, Yogyakarta, Klaten, and Surakarta, our study trained the e-Nose to distinguish individuals with TB from healthy subjects and those with other respiratory conditions. Afterward, we tested the e-Nose on presumptive TB patients. Participants provided breath samples into air-collecting bags, which were analyzed by the e-Nose connected to a laptop. Support Vector Machine algorithms processed the data. Diagnostic accuracy was assessed against composite reference standards, integrating clinical symptoms, bacteriological examination, chest X-ray, and follow-up. Ethical clearance was obtained, and participants provided informed consent.
Result:
We trained the e-Nose to 27 individuals with TB, 24 healthy controls, and 53 with other respiratory diseases (median age: 43 years; BMI: 19.5 kg/m^2). We tested it on 1383 people screened for TB. No adverse events occurred. In the training phase with individuals with TB and healthy controls, the e-Nose had a sensitivity of 95% (95% CI=77-100%) and specificity of 82% (95% CI=60-95%). Analysis of the testing phase is ongoing.
Conclusion:
In this development phase, the e-Nose had high sensitivity and specificity. Further research is imperative to validate its performance across larger and diverse populations, including with different geographic regions and TB epidemiological profiles.

Aram Simonyan

American University of Armenia, Armenia

Power Dynamics in Corruption: How Bribe Takers Outpace Bribe Givers in Shaping Social Norms Through Rationalization

The social science literature has studied how different social norms influence human behaviour. Specifically, the previous studies differentiated between the impact of descriptive and injunctive social norms on how individuals shape their behaviour, such as around drinking, littering, and corruption. The impact of social norms on humans is undeniable; however, recent research points out and, at the same time, misses how individuals' behavior forms descriptive and injunctive social norms. Previous literature has overlooked how individuals' behaviour can initiate and normalise socially disapproved corruption-related social norms through rationalisation. More specifically, the link between individual perceptions of social norms that prompt them to action and their consequent impact on shaping corruption-related social norms is unstudied. This paper aims to research how the bribe giving and taking decisions can shape corruption-related social norms. Moreover, this paper studies the role of rationalisation in strengthening or weakening the link

between one's bribing considerations and perceived social norms. This study examines corruption-related social norms in Armenia following the Velvet Revolution. It draws on survey data collected from 1,500 individuals across all ten regions and Yerevan in 2019. The analysis employs Structural Equation Modelling (SEM), accounting for the complex survey design. Findings suggest that bribe-takers are more influential in shaping corruption-related social norms than bribe-givers. Additionally, the study highlights the mediating role of rationalization in decisions involving bribery transactions.

Borgar Aamaas

CICERO Center for International Climate Research, Norway

Continued global warming from aviation in the 21st century

The GYA is based heavily on flight-intensive AGMs, as the members need to meet physically sometimes, and not only digitally. However, our research shows that continued air travel growth will lead to continued warming even if aviation becomes green.
We investigate the impact global aviation has on global temperatures based on scenarios recently provided by the International Civil Aviation Organization (ICAO). These scenarios consist of a frozen technology baseline and three mitigation scenarios, IS1, IS2 and IS3, with different levels of implementation of alternative fuels. In the most ambitious scenario in terms of climate, IS3, fossil fuel is phased out by 2040. Aviation leads not only to emissions of CO2, but also a number of non-CO2 effects that are important to account for, in particular contrails, which is cloud formation caused by the exhaust from the airplanes.
By using a simple climate model, we find that the current warming is about 0.04 °C from aviation, but may increase as much as to 0.18 °C by 2070 in the baseline and to 0.10 °C in the IS3 scenario. Hence, even if fossil fuels are phased out aggressively, the warming from aviation will more than double in 50 years. This continued warming is due to some residual life-cycle CO2 emissions from green fuels and continued contributions from non-CO2 emissions as the non-CO2 effects are likely to stay even with climate-friendly alternative fuels. The exact role of aviation non-CO2 effects is, however, highly dependent on various assumptions and is subject to significant uncertainty.

Elena Kuzmin

Concordia University, Canada

Synthetic Lethal Interaction Network of Chromosome 4p Loss In Basal Breast Cancer

Chromosome 4p (chr4p) loss is a recurrent large chromosomal deletion in basal breast cancer, the predominant molecular subtype of triple-negative breast cancer (TNBC), associated with the worst prognosis and a proliferative state. To characterize chr4p synthetic lethal network in basal breast cancer and uncover mechanisms underlying the buffering of chr4p loss, basal breast cancer samples with copy-neutral and deletion status of chr4p were identified within our basal breast cancer primary tumor and patient-derived xenograft panel and by leveraging publicly available Cancer Cell Line Encyclopedia data. Differential gene expression analysis revealed that chr4p deletion is associated with global transcriptomic changes involving cellular respiration and redox

balance. Analysis of publicly available DepMap genome-wide CRISPR-Cas9 screening data identified genetic interactions specific to chr4p deletion in basal breast cancer enriched for similar pathways. Functional validations of the genetic interactions resulted in decreased viability in chr4p deleted compared to copy neutral samples. High-resolution respirometry analysis revealed that chr4p deleted cells are less respiratory and have a high proton leak. Consistent with this observation, chr4p loss was associated with reduced protein abundance of mitochondrial respiratory complexes and elevated reactive oxygen species levels. The evolution of chr4p loss is associated with a metabolically quiescent state suggesting of selective pressures for this chromosomal deletion. Chr4p deleted cells showed heightened sensitivity to compounds targeting redox balance. Ultimately, this study provides a unique dataset for studying how large chromosomal deletions can be used as targetable biomarkers in TNBC, revealing potential novel therapeutic avenues for precision oncology.

Éva Dékány

Hungarian Research Center for Linguistics and Eötvös University, Hungary

Categories in language: the plain vanilla, the missing and the mixed

English speakers take it for granted that there are separate word classes for nouns (‘computer’, ‘cat’), verbs (‘weigh’, ‘donate’), adjectives (‘big’, ‘yellow’) and prepositions (‘under’, ‘between’). However, only nouns and verbs are present in every language. Some languages have no adjectives at all. In these languages, the meanings expressed by English adjectives (e.g., color, age, dimension) are expressed by verbs. In Ainu, for instance, there is no word that directly corresponds to English ‘black’, but there is a verb whose meaning can be approximated as ‘be black’. We know that it is a verb because it takes the endings of verbs and appears in all and only positions available for verbs. It has no comparative (’blacker’) or superlative form (‘blackest’) either. In Ainu this is not just a property of ‘be black’; it holds for all meanings expressed by adjectives in English. Prepositions (and postpositions) are also missing from some languages. That does not mean that what English conveys by postpositions cannot be expressed. For instance, the meaning of ‘with’ can be relayed with the verb ‘use’ (‘use/using chopsticks’ instead of ‘with chopsticks’). Even within English, not all spatial relations are expressed by prepositions: ‘near’ is used like prepositions, but it borders on the class of adjectives (‘near’, ‘nearer’, ‘nearest’). The distinction between verbs and noun is not as clear-cut as we may think either. In English, we can derive nouns from verbs by ‘-ing’: ‘(to) run’ vs. ‘running’. The derived noun ‘running’ is like regular nouns in that it can take a possessor or an ‘of’-phrase (‘Michael’s running of the marathon’). It is also like plain vanilla nouns in that can be modified by an article or adjectives (‘the quick running of the marathon’). However, like verbs and unlike ordinary nouns, in can also be modified by adverbs (‘the running of marathons regularly on weekends’). This shows that on some level, ‘running’ is both a noun and a verb, or a mix thereof.

Hanjo Hamann

EBS University of Business and Law, Germany

Don't Sign Away Your Copyright!

There are two worlds of publishing: The medieval one and the modern one. The medieval world was one where labor was divided: Content creators created content, publishers published it. Law was quite inconvenient because it protected the content creators, who were not the ones distributing their own work and protecting it against plagiarism etc. Hence content creators and publishers signed contracts wherein the content creators transferred any and all of their rights to a publisher, who then took "good care" of these rights until 70 years after the creator's death. As a reward (and incentive) for this stewardship, the publisher was allowed to extract all the revenue they could generate, minus some royalties (which in academic publishing were always rather symbolic). This exchange meant that not even the creator themselves, or their children, or their children's children were allowed to use their work without the publisher's permission. Such was the medieval world of publishing. Now there is a modern world of publishing, where digital media allow virtually anyone to publish virtually anything with virtually unlimited reach. Creators still need publishers because of their marketing expertise and their access to retail platforms. But this narrowly focused expertise is simply a service that content creators buy from a publisher; it no longer warrants an all-encompassing general kind of stewardship. Thus the modern world of publishing is one where creators retain their (copy)rights, but give a non-exclusive license to publishers in order to perform their service. There is no longer any reason to sign away copyrights until 70 years after the author's death. I will briefly show how to do this in practice.

João Borges

University of Aveiro, Portugal

Self-assembling Multicomponent Biomaterials for Controlled Drug Delivery and Regenerative Medicine

Nature provides us with an impressive toolbox of building blocks that have inspired scientists to create complex artificial biofunctional systems to develop advanced regenerative therapies. Among the biological systems is the native extracellular matrix (ECM) of tissues and organs, which is formed by the dynamic supramolecular self-assembly of fibrous proteins, glycosaminoglycans and proteoglycans. Such a fascinating supramolecular biological landscape has inspired the design of ECM-like soft supramolecular multicomponent biomaterials to recreate the native cellular microenvironment and, ultimately, regenerate and/or substitute damaged tissues and/or organs.
In this talk, emphasis will be given to the synergistic use of polysaccharides, proteins, peptides and nucleic acids, as well as molecular self-assembly approaches towards the supramolecular engineering of a library of soft multicomponent biomaterials to interface with living systems. We will discuss how these building blocks can be combined and assembled into chemically programmable and dynamic supramolecular multicomponent hydrogels and layer-by-layer-driven nanobiomaterials to be used as platforms for controlled drug delivery and as bioinstructive matrices to control cell functions in advanced regenerative medicine strategies.

Luisa Maria Diele-Viegas

University of Mississippi, United States

Bridging Scientific and Traditional Knowledge for Environmental Conservation

Environmental conservation in a changing world requires innovative approaches integrating diverse knowledge systems. Scientific research provides powerful tools for understanding ecological dynamics, but traditional and Indigenous knowledge offers invaluable long-term observations, cultural insights, and place-based conservation strategies. This talk will highlight how bridging these perspectives leads to more effective and socially just conservation initiatives. Drawing from projects developed in the BioDivA Lab, we will explore case studies where transdisciplinary collaboration has strengthened biodiversity conservation. These include ecological niche modeling of culturally significant plant species, participatory approaches to understanding climate change impacts on local ecosystems, and community-driven strategies to sustain biodiversity and ecosystem services. Working alongside Indigenous and local communities leads to deeper ecological insights while fostering reciprocal knowledge exchange and co-creating solutions that respect cultural values and practices. Integrating scientific and traditional knowledge improves ecological research and ensures that conservation actions are locally relevant, socially inclusive, and globally impactful. This talk will emphasize the importance of ethical, equitable, and long-term partnerships that empower communities and enhance conservation efforts.

Malgorzata Gazda

University of Montreal, Canada

Meta-research- science of science

Improving reporting in science.
In addition to my genetics research, which focuses on linking genotype to phenotype, I am actively involved in meta-research—the study of scientific practices and standards. One example of this work is our project titled "Creating Clear and Informative Image-based Figures for Scientific Publications." Scientific figures are essential tools for communication and should be accessible to a wide audience. While many resources address image manipulation and technical specifications, there is limited guidance on the clarity and interpretability of scientific images.
In this study, conducted with a team of eLife Ambassadors, we examined non-blot images in leading journals across three disciplines: plant sciences, cell biology, and physiology. We found widespread issues, including missing scale bars, unclear insets, and poor accessibility for colorblind readers. Beyond identifying these problems, we provided researchers with detailed examples of best—and poor—practices, along with practical recommendations for improvement.
This paper has had significant reach, with over 40,000 views on PLOS Biology and strong engagement globally, including notable interest from the Global South. More recently, our meta-research group published a commentary highlighting good practices in data reporting. We emphasize the importance of transparency, metadata, and data quality to foster trust, enable critical evaluation, and support data reuse.

Martin Schletterer

BOKU University & TIWAG - Tiroler Wasserkraft AG, Austria

River Science and sustainable management

The water-food-energy nexus is crucial for sustainable development. Rivers have served as lifelines for hu-man civilization, providing transportation routes and ecosystem services. River Science aims a holistic view, taking into account natural sciences, engineering and socio-political sciences. Also in the light of the SDGs water is a central aspect, that in fact is indirectly linked to all other targets. Nowadays, many river systems are exposed to multiple stressors, which are exacerbated by climate change. Thus, sound monitoring is needed to understand natural variability and anthropogenic stressors. In our changing world we need long term research and monitoring at reference sites (e.g. REFCOND_Volga) as well as specific research projects such as FRAGILE (Fluvial Transport Process Alterations in partly Glaciated Catchments forced by Climate Change).
In Europe, the Water Framework Directive uses Biological Quality Elements, i.e. algae and macrophytes, invertebrates and fish as well as plankton, for bioindication. This can be achieved by combining conventional as well as novel methods (e.g. environmental DNA). However, to answer certain questions, we need to go also beyond “standard monitoring”, thus specific research is needed e.g. related to hydropeaking mitigation, fish downstream migration as well as sediment management. Examples from the hydropower sector underline the need of process understanding as a prerequisite for the design of measures. This talk highlights the importance of river science and the close links between research and development as well as monitoring, which together build the basis for sustainable management.

Mbuzeleni Hlongwa

Human Sciences Research Council, South Africa

Integration of PrEP Dispensing with HIV Self-Testing Among Men in KwaZulu-Natal, South Africa

Gender disparities are pervasive throughout the HIV care continuum in sub-Saharan Africa (SSA), with men testing, receiving treatment, and achieving viral suppression at lower rates, compared with women. Despite several attempts to meet their HIV prevention needs, men continue to have high rates of HIV infection. Pre-exposure prophylaxis (PrEP) is an HIV prevention approach, that, when taken as recommended, can reduce the risk of HIV acquisition by 99%. However, there is a dearth of research focused on PrEP among men in South Africa. HIV self-testing (HIVST) offers a new approach to improving men’s HIV testing rates and removing some of the traditional barriers associated with accessing clinic-based HIV testing services by enabling individuals to conduct and interpret their own HIV tests at their convenient time and chosen private space. HIVST can play a critically important part in improving PrEP access and use among men. Given this context, this study aims to investigate the integration of PrEP dispensing with HIV self-testing as a novel approach to address the pressing challenges faced by men in KwaZulu-Natal, South Africa, using a mixed-methods approach. By examining the feasibility and factors influencing PrEP uptake and continuation within this integrated model, this study aims to provide critical insights that can inform tailored, effective design interventions to improve PrEP access and use among men.

Meriem Chaanaoui

Hassan 1st University, Morocco

Solar Heat for Industrial Processes: Insights from The Phosphate Solar Drying Research Project

The integration of solar heat into industrial processes is a promising avenue for reducing fossil fuel consumption and industry decarbonization. The Phosphate Solar Drying Research Project explores the potential of solar thermal energy in the mining industry, particularly for drying applications. This study investigates the feasibility, efficiency, and economic viability of solar-assisted drying systems tailored for phosphate processing.

A key focus of the research is the design and optimization of solar thermal collectors. The study examines solar drying using Parabolic trough solar collectors, and their integration with conventional rotary drying systems. Additionally, computational simulations and experimental data provide insights into heat transfer efficiency, drying kinetics, and system performance under varying climatic conditions.

Preliminary findings indicate that solar-assisted drying can significantly reduce energy costs and carbon emissions while maintaining high drying efficiency. The project also highlights challenges such as seasonal variations, land requirements, and initial investment costs.

The research contributes to advancing sustainable industrial practices by demonstrating the practicality of solar thermal integration in phosphate processing. The findings support broader adoption of solar heat in industrial applications, fostering energy resilience and sustainability in resource-intensive sectors. Future work will focus on scaling up solar drying technologies and optimizing hybrid energy models for large-scale industrial implementation.

Miriam Cohen

Université de Montréal, Canada

Human Rights and Climate Change: Connecting the Dots

This panel explores the critical intersection between human rights and climate change, examining how environmental degradation increasingly threatens the realization of fundamental rights. It will highlight legal and policy frameworks that integrate human rights into climate action, with particular attention to the role of reparative justice in addressing historical and ongoing damages. The discussion will consider how courts, international bodies, and civil society contribute to advancing accountability and equitable redress. By connecting these dots, the panel aims to identify pathways toward more inclusive climate governance.

Mohammed Mostajo-Radji

University of California Santa Cruz, United States

Reducing education inequalities through cloud-enabled live-cell biotechnology

Biotechnology holds the potential to drive innovations across various fields from agriculture to medicine. However, despite numerous interventions, biotechnology education remains highly unequal worldwide. Historically, the high costs and potential exposure to hazardous materials have hindered biotechnology education. Integration of cloud technologies into classrooms has emerged as an alternative solution that is already enabling biotechnology experiments to reach thousands of students globally. I will showcase several innovations developed by our group that collectively facilitate real-time experimentation in biotechnology education in remote locations. These advances enable remote access to scientific data and live experiments, promote collaborative research, and ensure educational inclusivity. We propose cloud-enabled live-cell biotechnology as a mechanism for reducing inequalities in biotechnology education and promoting sustainable development.

Mojtaba Abdi Jalebi

University College London, United Kingdom

Functional Nanostructured Materials for Solar Cells and Green Fuel Production: Pathways to a Sustainable, Carbon-Neutral Future

Achieving a sustainable and carbon-neutral future is one of the most critical challenges of our time. To address this global imperative, next-generation electrochemical systems and advanced nanostructured materials are emerging as key enablers of transformative energy solutions. This presentation examines the opportunities and challenges in the development of these materials for energy applications, focusing on two crucial areas: solar energy utilization and carbon capture and conversion. In the field of solar energy, novel functional nanomaterials, particularly halide perovskites, have significantly advanced the potential of photovoltaics. I explore the chemical modifications, nanostructure tuning, and passivation strategies that enhance the efficiency and stability of halide perovskite solar cells, showcasing their potential to redefine the renewable energy landscape. Furthermore, the urgency of addressing climate change necessitates innovative methods for carbon capture and utilization. I discuss the development of advanced nanostructured materials and electrochemical systems designed for sustainable direct CO_2 capture and its conversion into clean solar fuels. These advancements offer the promise of a circular carbon economy, where CO_2 emissions are transformed into valuable resources. Our work paves the way toward a cleaner, more sustainable energy future through the integration of next-generation electrochemical systems and advanced nanostructured materials, with the ultimate goal of building a sustainable world for future generations.

Monir Ahmed

Qassim University, Saudi Arabia

Does the world have visionary leaders to achieve the SDGs?

The most important requirement to achieve any goal is the leadership. We can not achieve any goal on time without right leadership even if we have all the resources and time. This is true for sustainable development goals too. Achieving these ambitious goals requires visionary leadership capable of inspiring collective action, fostering innovation, and overcoming complex global challenges. Does the world have enough high-quality leaders achieving SDGs? This paper examines whether the world currently possesses such leaders.

Here and there we have some leaders that demonstrate commitment to the SDGs geopolitical conflicts often hinder progress. Case studies of influential figures in government, international organizations, and grassroots movements reveal both successes and gaps in leadership. The study also explores the role of emerging leaders from youth and marginalized and scientific communities in driving change.

The findings suggest that while sporadic examples of visionary leadership exist, a broader, more coordinated effort is needed from UN to accelerate SDG achievement by improving leadership around the world.

Mutshidzi Mulondo

University of the Free State, South Africa

Integrating Mental Health into Primary Healthcare in Africa

Mental Health is increasingly being regarded as the second pandemic of our generation. The WHO defines Mental Health as a state of wellbeing in which an individual realises their abilities, can cope with the normal stresses of life, work productively and contribute to their community. With the realisation that mental health is vital, what are the strides and progress made in ensuring that it is integrated in primary healthcare, where a majority of the underprivileged access their health services in Africa.

Santosh Kumar Gupta

Bhabha Atomic Research Centre, India

Lanthanide Doped Inorganic Crystals for Solid State Lighting and Photon Upconversion

The hunt for energy-efficient solid-state materials for lighting and other display applications took an enormous pace in the past few decades owing to many fold increases in global energy demand. Solid state lanthanide ion doped phosphors have come up as the material of choice for these purposes due to their unique and unrivalled features like longer excited state lifetime, high photo-luminescence quantum yield, well-defined narrow spectral pure emission, higher photostability and environmental benignness. These materials are meant to meet the various needs of this century,

which is riding on rapid advancement in optoelectronic devices. This talk will discuss some of the most widely used lanthanide ions from the perspective of activator and a sensitizer in doped materials and possible transitions within their energy levels. Here, we will also discuss the effect of various hosts on the optical emission properties of lanthanide ions and their application in solid state lighting and up-conversion.

Natisha Dukhi

Human Sciences Research Council, South Africa

Teens Want Tech: Exploring App Solutions for Adolescent Health

Overweight and obesity are increasingly prevalent among South African adolescents, driven by urbanization and health determinants contributing to reduced physical activity (PA) and unhealthy eating habits. These trends elevate the risk of chronic health conditions. The iLembe School Physical Activity and Nutrition (i-SPAN) study aims to assess the strengths and weaknesses of South African interventions. While some school-based diet and PA programs have been successful in low-income areas, a gap remains in mobile health (mHealth) interventions tailored to school-going children in African contexts.

Given mHealth's potential to support dietary and PA interventions, developing context-specific strategies for South Africa's unique health challenges is crucial. However, sustaining such initiatives is challenging due to limited funding and resources.

The sub-study, Evaluation of the feasibility and acceptability of smartphone technology in delivering diet and physical activity interventions for adolescent obesity prevention, represents a crucial early phase in this process — the co-design of mobile app content. Central to this phase is engaging adolescents in feedback-driven development to ensure the intervention is relevant, practical, and appealing. This participatory approach will inform the design of an intervention to assess the effectiveness of mobile-based school programs targeting diet and PA behaviors among Grade 5 learners (aged 10–12 years).

Qualitative data will be analysed using Atlas.ti, providing insights into adolescent preferences and intervention feasibility. The study has received approval from the KwaZulu-Natal (KZN) Department of Basic Education and ethical clearance from the University of KwaZulu-Natal (UKZN) Biomedical Research and Ethics Committee. Assent and written consent was obtained from all participants.

Nina Yasuda

The University of Tokyo, Japan

Exploring Inter-disciplinary research for Marine biodiversity conservation

My work focuses on demystifying the complexity of marine ecosystems and exploring conservation strategy. Initially, I tackled the crown-of-thorns sea star (COTS) phenomenon, which threatens coral reefs through unpredictable outbreaks. By merging field-based larval surveys, genetic marker development, and ocean current modeling, I uncovered how COTS disperse and trigger large-scale reef devastation. In parallel, I investigated climate change–driven shifts in coral distribution, particularly the northward expansion of some species into temperate zones. These findings allowed

me to highlight critical connectivity corridors, essential for designing effective marine protected areas.
However, scientific knowledge alone does not guarantee ocean stewardship. To bridge science and public consciousness, I am infusing art into marine conservation. My vision includes installing sculptural works beneath the waves and creating underwater spaces akin to Japanese gardens. These artistic reefs would not only enhance biodiversity by providing new habitats, but also serve as captivating “living galleries” for divers. By immersing visitors in an aesthetically and ecologically rich environment, I hope to cultivate a sense of awe and responsibility toward the marine world.
In tandem with artistic innovation, I am refining environmental RNA (eRNA) techniques to detect organismal stress from seawater samples. This groundbreaking approach promises real-time insights into reef health, enabling proactive interventions. Ultimately, my goal is to weave scientific rigor, artistic expression, and community engagement into a cohesive strategy—one that empowers people to connect with the ocean on a deeper level and safeguards the invaluable biodiversity that lies beneath the surface.

Nova Ahmed

North South University, Bangladesh

Necessary Ingredients needed to Success: Looking at Women in Computing of Bangladesh

This work looks at 71 participants who are or related to Women in Computing (WiC). It includes 48 tertiary level students and 23 professionals along and stakeholders with Bangladeshi WIC within and outside the country. The work focuses on the lower representation of WiC professionals and seeks the answer to the simple question of what makes them sustain in their professional journey. The work uses indirect and direct responses through fictional inquiry for the tertiary-level students it used letter writing workshops to fictional characters – one letter coming from a supporting female imaginary character and one letter coming from a fictional male character doubting the abilities of women and the responses were collected in letter writing. The professionals and stakeholders used one to one interviews sessions to share their viewpoints. The analysis of the work shows the continuous work on self-efficacy and skill development, increase the sense of belonging through internal and external support and finally, providing safe transportation and safety for the successful retention of WiC professionals. It was surprising to find out that majority of the challenges the participants discussed were stemmed from various social norms and practices at the same time, the solutions to the problems lied in social and communal support. This work can be useful for other marginal communities fighting social perception and opportunity related barriers. This work was supported by funding from Google.

Oscar Xavier Guerrero Gutiérrez

Cinvestav, Mexico

How AI Can Help Us Understand Molecules Better—and Faster

Modern chemistry relies more and more on computers. Besides mixing chemicals in a lab, many scientists simulate molecules using powerful software. But these simulations are approximations that can be slow, complex, and sometimes even give the wrong answer. My work focuses on building tools to make this kind of chemistry research easier, faster, and more reliable. One of the tools I developed is an open-source Python package called PyCRDFT that helps automate the study of chemical reactivity—how molecules behave and interact—based on Chemical Reactivity Density Functional Theory. PyCRDFT makes it possible for chemists to run large-scale studies with less manual effort and fewer errors. Another area of my research involves using machine learning (ML) to go beyond the limits of traditional simulation methods. In the group I am currently working, we have studied how amino acids, small building blocks of proteins, fold into specific shapes. Surprisingly, many standard methods based on DFT and used by chemists failed to correctly predict these shapes. But newer approaches based on ML did match the experimental results. This is important because getting the shape wrong can lead to wrong predictions in things like drug development or materials design. We have also used ML to study how complex molecular machines assemble themselves—something that is unfeasible to simulate using traditional methods. Thanks to ML, we can now explore these processes in more detail than ever before. My goal is to build open, flexible tools that empower researchers around the world to push the boundaries of what's possible in scientific research.

Ovie Edegbene

Federal University of Health Sciences, Otukpo, Nigeria

Evaluating the Health of Urban Streams in Africa Using a Functional-Based Approach

Urban streams worldwide have been significantly impacted by various anthropogenic activities, leading to altered flow regimes, disrupted hydrological cycles, and the degradation of aquatic biota. Historically, the health of African streams, including urban streams, has been evaluated using traditional taxonomic and physico-chemical approaches. However, these methods have limitations, such as their inability to detect long-term disturbances and their narrow scope of assessment. The emergence of functional-based approaches has transformed the assessment of urban stream health in Africa. This method focuses on the ecological traits and preferences of biota to evaluate the impacts of human activities on stream ecosystems. While this approach has been extensively applied in Europe and North America, it has only recently gained traction in Africa. Our research, conducted since 2018, has significantly advanced the application of functional-based approaches in African urban stream assessments. This method is cost-effective, user-friendly, and requires minimal expertise, making it accessible for widespread adoption. Despite its advantages, the functional-based approach in Africa remains in its infancy. A key challenge is the reliance on trait databases developed in Europe and other developed regions, which may not accurately reflect local ecological conditions. Consequently, we advocate for the development of region-specific databases to ensure more accurate and contextually relevant assessments of urban stream health in Africa.

Piyush Kumar

Icahn School of Medicine at Mount Sinai, United States

Tooth as a Time Capsule: Uncovering Early-Life Stress and Environmental Exposure via Chemical Imaging

Teeth begin forming during the fetal stage and develop daily growth lines, known as incremental lines, which can provide a chronological record of development across different regions of the tooth crown and root. During periods of physiological or psychological stress, the secretion of dental matrix can be disrupted, resulting in the formation of accentuated lines. These appear as dark bands under light microscopy and serve as markers of stress episodes and can be used for reconstruction of an individual's stress history.
Recent advances have enabled us to extract biochemical information along these lines. Our group has employed techniques such as inductively coupled plasma mass spectrometry and Raman spectroscopy to detect molecular changes associated with stress. In this talk, I will present findings from our Raman-based analysis of children's teeth, where we observed biochemical alterations linked to illness and prolonged medical treatment during early infancy. Future studies involve investigating spectral markers for stress and environmental exposures.

Pooja Devi

CSIR-Central Scientific Instruments Organisation, India

MXene and MXene Dervied Heterostructure-Potentail Catalyst for Green Hydrogen

The transition to sustainable energy has intensified the search for efficient and cost-effective electrocatalysts for green hydrogen production. MXenes, a unique class of two-dimensional (2D) transition metal carbides and nitrides, have emerged as promising candidates due to their exceptional electrical conductivity, tunable surface chemistry, and hydrophilic nature. However, their catalytic performance can be further enhanced through heterostructure engineering. This talk will explore the potential of MXene and MXene-derived heterostructures as advanced catalysts for electrochemical and photoelectrochemical water splitting. Key focus areas include MXene interlayer spacing, surface modifications, synthesis conditions role to optimize hydrogen evolution reaction (HER) activity, synergistic interactions in MXene-based heterostructures that enhance catalytic efficiency and stability, and recent advancements in developing scalable and cost-effective catalysts. By leveraging the unique physicochemical properties of MXene-based materials, this talk will highlight their role in accelerating the hydrogen economy and enabling cleaner energy solutions.

Prabhat Singh

Bhabha Atomic Research Centre, India

Fluorescence-based Sensors for Alkaline Phosphatase: Leveraging AIE and Supramolecular Aggregation

This talk presents the design and application of fluorescence-based sensors for Alkaline Phosphatase (ALP), a crucial enzyme involved in various physiological and pathological processes, including liver function, bone metabolism, and certain cancers. Given the clinical relevance of ALP as a biomarker, developing sensitive and selective detection platforms is imperative. The focus will be on novel sensing strategies that exploit Aggregation-Induced Emission (AIE) and supramolecular self-assembly, where enzymatic activity triggers controlled aggregation or disassembly to generate a measurable fluorescence response. These AIE-based systems offer enhanced sensitivity, low background interference, and robustness in complex biological environments, making them highly promising for point-of-care diagnostics and biochemical research.

Praveen Kumar

Indian Association for the Cultivation of Science, Kolkata-700032, India

Harnessing Spin-Dependent Catalysis in 2D Materials for Energy Harvesting Applications

In this talk, I will present my research on advancing spin-dependent catalysis through engineered two-dimensional (2D) materials, with a focus on fundamental mechanisms and their potential for transformative applications. I will discuss the role of spin-orbit coupling in Janus MoSSe, where an external magnetic field modulates its catalytic activity, enabling spin-dependent electrocatalysis. By integrating delaminated Mo_2C-Tx MXene with MoSSe/SiNW photocathodes, we achieve a 52% enhancement in photocurrent under a 0.4 T field at zero bias, demonstrating a novel route for efficient photoelectrochemical (PEC) water splitting. Additionally, I will highlight magnetically induced hydrogen evolution in quasi-2D $MnSe_2$, showcasing the potential of asymmetric 2D materials for next-generation catalytic systems.

Reem Abou Assi

Al-Kitab University, Iraq

Science Impact To Heal Conflict Zone Youth: When Humanity Is Given A Second Chance

Delving into the realm of skin research often sparks profound reflections on its symbolism as a metaphorical haven, akin to one's home, country, or motherland, each imbued with its own distinct essence. Much like the skin's pivotal role in shielding and delineating the human body, a person's country serves as a protective bastion, encapsulating their identity and affording a sense of

security. The profound loss of either engenders a profound sense of anguish, akin to forfeiting a fundamental aspect of one's existence.
Amidst the turmoil of conflict, science emerges as a beacon of hope, offering a path to healing and empowerment. In the not-so-distant past, the tranquil town where I now serve as a lecturer at the College of Pharmacy, Altun Kupri, was entrenched in conflict. Memories of tanks and army battalions, and the arduous crossing of the Zab River to reach the college, are etched in history. Yet, amidst the triumph of light over darkness, many inner lights within the hearts of the youth flickered perilously.
The next time you feel demotivated to attend class, ponder the narratives of university students who, amidst airstrikes, steadfastly pursued education as a harbinger of peace, reminiscent of those who tardily joined my lectures, citing "the army was cleansing the area" as their reason. At such a level, you will realize that war comes with one flavor, neither strawberry nor chocolate, but sorrow!
Extracurricular educational activities served as a catalyst for many students to rediscover self-belief and rekindle joy in life, subsequently finding purpose. From writing to science videos and symposiums, as well as online international collaborations and competitions, students value the moment and the diverse team. Instead of wishing miracles, they decided to contribute to the much-awaited situation of "Things Getting Better". Collaborating with a multicultural team from our diverse locale helped youth realise that Iraq is a collective, united entity

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Shabana Khan

Indian Research Academy, India

Infodemic & Disaster Risk Communications: Key Challenges and the Way Forward

The infodemic caused widespread damage during COVID-19. However, it didn’t end with the pandemic but marked the beginning of a more significant issue that the world is facing today. Coined in 2003, the term referred to excessive information, making it challenging to distinguish between accurate and inaccurate information. However, with the increasing complexity of nature and sources of information, its definition, stakes and implications have altered. A study is thus conducted to assess the infodemic in the post-COVID-19 risk communication and governance in Bangladesh, India, and the United Kingdom. A mixed method approach was used, involving the primary data collection with 105 key stakeholders across the three countries, including 15 global experts, and secondary data from the leading newspapers from each of the three selected countries from 1 January 2020 to 30 June 2024. The research shows an increasing trend of the infodemic in Bangladesh, India, and the United Kingdom, which is concerning and demands attention. A rise in infodemic not only defies the purpose of risk communication but also affects the effectiveness of governance measures applied before, during and after disasters. Today, the impacts of the infodemic are not limited to health hazards or emergencies but extend to other geophysical and socio-political events. In such a scenario, not having a comprehensive risk communication policy is a critical gap in disaster preparedness. Further, there is a need to integrate early warning systems with community engagement and structures to address the infodemic, which also requires the active participation of related stakeholders.

Shymaa Enany

Suez Canal University, Egypt

From Birds to Humans: The Story Behind the Second Genome of a Novel Pathogen

Chronic disease management often involves sequential decisions that have long-term implications. Those decisions are based on high amounts of information, which must be quickly assimilated in busy clinical practices.
I describe some of my ongoing research personalizing monitoring decisions of patients with glaucoma. As new information about the patient is obtained during each visit, the models dynamically incorporate the new information with existing historical data to determine the optimal timing at which patients should be monitored. The models can be tailored to each individual patient's characteristics. They are designed to support, not supplant, the joint decisions made by patients and clinicians. If our models were to be used to assist clinicians in managing glaucoma patients across the US, we estimate this would save the US healthcare system over 10 million tests with no drop-off in disease progression detection.

Thao Thi Phuong Nguyen

Academy of Medical Sciences in Vietnam, Vietnam

CRISP Project – Smartwatch & Mobile-App Integrated AI Screening for Mental Health

Young adulthood (18–28 years) is a period of intense life transitions during which depression, anxiety, and stress often emerge yet remain under-detected. The CRISP study prospectively tracks 900 Vietnamese and Korean young adults to reveal how real-world circadian disruption predicts mental-health deterioration and to build an artificial-intelligence (AI) screening tool deliverable by smartphone. Nine monthly cohorts wear a Biostrap smartwatch continuously for 30 days, yielding high-resolution photoplethysmography, activity, and sleep data. Advanced Kalman-filter and Cosinor models extract central (CRCO) and peripheral (CRPO) circadian phases, from which misalignment metrics, heart-rate-variability indices, and rhythm robustness (IS/IV) are derived. Weekly in-app surveys (PHQ-9, GAD-7, PSS) provide validated symptom trajectories that are merged securely with physiological streams. Population-averaged (GEE) and individual-level (mixed-effects) analyses quantify longitudinal links between misalignment and symptom severity. A multimodal late-fusion AI pipeline—time-series deep-learning models for signals and XGBoost/TabNet for lifestyle data—generates explainable predictions; hyperparameters are optimised with Optuna, and performance is benchmarked via AUROC and F1. The resulting cross-platform app delivers real-time risk alerts when circadian or behavioural indicators approach thresholds, enabling proactive self-care and clinical referral. De-identified data, IRB approval, and encrypted cloud storage ensure privacy and ethical compliance. CRISP aims to establish wearable circadian biomarkers and scalable AI tools for early mental-health intervention.

Thiago Lima

Fluminense Federal University, Brazil

The use of residual biomass for energy purposes: driving sustainability and circular economy

Our society is highly dependent on fossil fuels for various activities in our daily lives. In this context, the aviation field strongly relies on petroleum for fuel production, but the demand for this fuel type is projected to exceed our supply capacity. Thus, it becomes necessary to study renewable sources as raw materials for producing sustainable aviation biofuels (SAFs) and supply part of this growing demand. Lignocellulosic biomass, especially urban waste and Water hyacinth (a substantial environmental problem in several parts of the world), is promising to be converted into bio-CA range molecules with properties similar to those alkanes obtained from petroleum. Considering this, this research project proposes the establishment of chemical conversion routes of biomass from tree pruning, grass, and Water hyacinth into SAFs using heterogeneous catalysis. Thus, this project, in addition to seeking to meet the demand for SAFs, also proposes a partial solution to environmental problems (such as the uncontrolled growth of water hyacinth), which can reduce the expense of public money for the collection and correct disposal of these lignocellulosic biomass residues. In addition, another project is the use of sewage sludge for catalysts production - in Brazil (and worldwide), sewage sludge is a significant issue regarding its incorrect disposal and causes environmental contamination with several metals. In that way, we had the insight into using this inorganic/organic source as catalyst feedstock that, under pyrolysis conditions, might yield quite efficient material for biomass conversion into biofuels and value-added building blocks for the pharmaceutical and fine-chemical industries.

Tomislav Mestrovic

University North, Croatia / University of Washington School of Medicine, US

The Past, Present and Future of Antimicrobial Resistance Burden: a Data-Driven Call to Action

Antimicrobial resistance (AMR) is a defining global health challenge of our time. While prior studies have quantified AMR burden at global and regional levels, I would like to present the first comprehensive analysis spanning historical trends (1990–2021) and forecasting the future (to 2050) across 204 countries. Here, we assessed deaths and disability-adjusted life-years (DALYs) attributable to and associated with bacterial AMR for 22 pathogens, 84 pathogen-drug combinations and 11 infectious syndromes by using over 520 million data points from multiple sources - including mortality surveillance, hospital records, microbiology reports and antibiotic usage data. In 2021, bacterial AMR was linked to 4.71 million deaths, with 1.14 million directly attributable to resistant bacteria. Trends over time reveal a striking age shift: deaths in children under 5 declined by more than 50%, while mortality rose over 80% among adults 70 and older. Methicillin-resistant Staphylococcus aureus and carbapenem-resistant Gram-negative bacteria were the top contributors to AMR-related mortality. Projections suggest up to 8.22 million deaths associated with AMR could occur annually by 2050, disproportionately affecting South Asia and Latin America. However, hope remains. Better infection care and improved antibiotic access could avert 92 million deaths, in accordance with forecast models. Development of Gram-negative-

targeting drugs could prevent an additional 11 million. Hence, these findings underscore a dual imperative: continued focus on childhood infection prevention and urgent attention to the aging population's vulnerability. AMR is not just a microbial issue - it is a demographic, developmental and political one. Tailored interventions, vaccine coverage, responsible antibiotic use, as well as robust drug pipelines are thus essential to alter the trajectory of AMR on a global level.

Veda Krishnan

ICAR-Indian Agricultural Research Institute, India

Do you know gut taste what we eat?

Our understanding of taste has long been limited to the tongue, but emerging research reveals that the gut, too, plays a crucial role in sensing and responding to the food we consume. Beyond digestion, the gut harbors specialized nutrient-sensing cells that detect taste-active compounds, influencing metabolism, appetite regulation, and even food preferences. This talk will explore the biochemical and physiological mechanisms by which the gut "tastes" food, focusing on nutrient receptors, gut hormones, and their impact on health. We will discuss how this gut-brain axis shapes dietary responses, affects metabolic disorders, and opens new frontiers for precision nutrition. Could targeting gut taste receptors be the key to managing obesity, diabetes, or food cravings? Join us as we unravel the fascinating interplay between taste, digestion, and health.
Dr. Veda Krishnan is a distinguished researcher and faculty member at the Division of Biochemistry, ICAR-Indian Agricultural Research Institute (IARI), New Delhi, India. As the lead investigator of the Food Matrix Lab (www.vedakrishnan.in), her research focuses on exploring niche food matrices and validating their therapeutic potential. With a strong commitment to advancing global human health, her work spans food and nutrition research, bio-functional foods, and innovative processing technologies. Her current research aims to systematically characterize food matrices to enhance carbohydrate quality, particularly in the context of satiety regulation, by deciphering gut-sweet receptor signaling. Dr. Krishnan has an extensive publication record, with over 85 peer-reviewed articles and eight book chapters, alongside an Indian patent and the successful commercialization of two carbohydrate-enhanced food products. As an international speaker and expert in nutritional biochemistry, she continues to contribute significantly to the evolving landscape of food science and human health.

Viviana García Pinzón

Arnold-Bergstraesser-Institut (ABI), Germany

Confronting epistemic violence? A virtual encyclopaedia as a way of re-centring the pluralities of knowledge in peace and conflict studies

Peace and conflict studies (PACS) is a burgeoning and diverse field. Yet, it still needs to tackle the legacies of colonialism and its hierarchies, the historical trajectories of conflicts and their embeddedness in global entanglements. Postcolonial and decolonial approaches have pointed out that research and practice in the field are rooted in west-driven epistemological and ontological grounds resulting from colonial structures of power that hinder and often misconstrue our

understanding of peace, conflict, and violence contributing to the reproduction of the structures sustaining violence and epistemic injustices. Thinking of strategies to move towards (un)doing of epistemic violence, scholars have highlighted the need to interrogate and problematize foundational concepts in the different disciplines of Social Sciences as well as the importance of unsettling the patterns of (in)visibility by bringing the voices and different forms of knowledge of groups traditionally marginalized to the center. Against this background, this presentation will offer a brief reflection on the possibilities and challenges of a virtual encyclopedia (rewritingpeaceandconflict.net) as a tool to re-center pluralities of knowledge in peace and conflict studies. Concretely, it will introduce the rationale shaping the project, the principles and practices guiding the process, and the challenges we have encountered and the persistent tensions and contradictions of a project that aims to contribute to the pursuit of de-colonizing PACS, while being embedded in the Global North.

Wilson Alavia Medina

Disruptive Sustainable Technologies for Positive Change SpA, Chile

Carbon capture for a sustainable future: Opportunities and challenges

Climate Change is a global issue that requires immediate action, it is evidenced by the increasing global land and ocean temperatures, desertification, extreme changes in weather such as heatwaves and wildfires among others. One of the main factors that contribute to Climate Change is the CO2 emissions to the atmosphere, resulting from fossils fuels use and other anthropogenic activities. Many efforts have been conducted to lower CO2 emissions, like replacing fossil fuels with renewable energies for electricity and heat generation, and the promotion of electric vehicles to reach carbon neutrality. However, to reach the aim of global temperature increasing below 1.5 ° C, it is still necessary to take more actions to reduce CO2 emissions. For that purpose, the role of carbon captures is relevant, considering the carbon capturing, utilization and storage. Therefore, in this work is addressed the opportunities and challenges of carbon capture for a sustainable future.

Xavier Chiriboga Morales

Facultad de Agronomía, Universidad Central del Ecuador, Ecuador

Empowering insect science for global cha(lle)nge(s)

Life on our planet is undergoing tough ecological pressures in different aspects such as food security, climate change, emerging animal and human diseases and decreasing biodiversity. Insects are the most dominant Class of animals on Earth, in terms of number of species and ecological niches occupied by them. The great majority of insects (aprox. 99%) are beneficial and only 1% are detrimental to the life of humans. Therefore, there is an enourmous potential to take advantage of them in a variety of activities beneficial for the human beings. Beneficial insects can be used for solving issues of plant health, production of low-cost food and feed and other subproducts (medicines, oils, colorants, and other raw materials). Moreover, studying and protecting insects can be pivotal in addresing biodiversity issues such as the loss of zoophily pollination, and plant species which depend on that; and defending humans and animals from insect borne diseases. Global challenges should be tackled with global approaches; insect science

developed in an integrative, transdisciplinary and collaborative manner can helps us to realize a state of holistic health for people, animals, plants and the environment.

Yolanda López-Maldonado

Indigenous Science, Mexico

Indigenous Science Diplomacy: Elevating Indigenous Voices for Sustainable Global Futures

I explore the role of Indigenous Peoples (IP) in shaping global environmental policy and scientific research through the lens of science diplomacy. Indigenous communities possess ecological knowledge and sustainable management practices that are essential for addressing climate change and food security challenges. Indigenous Science Diplomacy (ISD) is an emerging field that combines IP knowledge with modern diplomatic practices to address global challenges and foster international cooperation. It aims to connect Indigenous science with Western scientific approaches. This involves: recognizing Indigenous science as a distinct, precise and valuable knowledge system; Integrating Indigenous methods; frameworks, tools and approaches into scientific research and policy-making; promoting mutual respect and understanding between different knowledge traditions. The concept emerges as a powerful tool for integrating IP perspectives into global scientific discourse and policy-making processes. I highlight the need to shift from a traditional "diffusionist" understanding of science diplomacy towards a more dialogical approach that acknowledges inequalities in global knowledge production and the value of IP epistemologies. It emphasizes the importance of including IP voices in international forums, where themes like climate leadership and biodiversity are discussed. Successful ISD initiatives, including collaborations between research stations and Sámi to address climate change impacts on IP livelihoods, are presented. I also explore the challenges and opportunities in integrating Indigenous science with modern scientific approaches to tackle global environmental issues. I conclude by emphasizing the need for a more inclusive and equitable approach to science diplomacy that respects IPs' worldviews, rights, and self-determination. ISD has the potential to create more inclusive, sustainable and effective approaches to addressing complex global challenges.